Tripura civil P-II

DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO.

TR/TES/C-II/DIP/ 16

Test Booklet Series

19.01.2017

D

TEST BOOKLET

CIVIL ENGINEERING PAPER – II

(DIPLOMA)

(Signature of the Candidate)

(Invigilator's Signature)

Time Allowed–3 hours (Three hours) **Maximum Marks–200**

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY TEST BOOKLET OF SAME SERIES.
2. **ENCODE CLEARLY THE TEST BOOKLET SERIES IN THE APPROPRIATE PLACE IN THE ANSWER SHEET BY BLACK BALL POINT PEN ONLY.**
3. This Test Booklet is divided into three sectionS, i.e **Section - A, Section - B & Section - C**.
   (A) **Section -A (MCQ pattern)** contains 40 items (questions). Each question, carrrying 2 (two) marks only, has four responses (answers). You will select the response which you want to mark on the **OMR Sheet**. In case you feel that there is more than one correct response, mark the response which you consider the most appropriate. In any case, choose ONLY ONE response for each item. There shall be no negative marking for wrong / multiple answer.
   (B) Questions under **Section-B (Conventional Method) & Section-C (Conventional Method)** are to be answered in separate **answer book**.
4. You have to mark all your responses of **Section - A by Black Ball Point Pen only** on the separate Answer Sheet provided. See directions in the Answer Sheet.
5. Before you proceed to answer the responses to various items in the Test Booklet, you have to fill in some particulars both in the Answer sheet for Section-A and in the Answer Book for Section-B and Section–C
6. On completion of the Examination, you should hand over the OMR Answer Sheet for Section – A & Answer Book for Section – B & C to the invigilator only. You are permitted to take the Test Booklet with you.
7. Sheets for rough work are appended on the Test Booklet at the end.

DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO.

The figures in the margin indicate full marks for the questions.

Candidates are required to answer the questions in their own words as far as practicable.

Scientific calculators are allowed.

Assume data reasonably, if required.

All symbols have their usual meanings.

SECTION – A

From the four alternatives provided with each question, choose the correct answer and mark on the OMR Answer Sheet. 2×40=80

Example : As per Indian Roads Congress recommendation, the width of a lane of any carriage way is

(A) 7.5 m

(B) 6.5 m

(C) 5.5 m

● 3.50 m

1. The property of fluid to change the volume under external pressure is known as

(A) Plasticity of the fluid

(B) Viscosity of the fluid

(C) Compressibility of the fluid

(D) None of the above

2. Gauge Pressure is equal to

(A) Absolute pressure - atmospheric pressure

(B) Absolute pressure + atmospheric pressure

(C) Atmospheric pressure - absolute pressure

(D) None of the above

3. A rise or fall of liquid in a glass tube of a very small diameter when the latter is dipped in it, is

(A) directly proportional to the force per unit length of periphery

(B) directly proportional to the sine of the angle of contact

(C) directly proportional to the specific weight of liquid

(D) directly proportional to the diameter of the glass tube.

4. On an inclined plane, centre of pressure is located

(A) at the centroid

(B) above the centroid

(C) below the centroid

(D) below or above the centroid depending upon the density of the liquid.

5. The velocity of the fluid particle at the centre of the pipe section is

(A) minimum

(B) maximum

(C) equal throughout the section

(D) None of the above

6. The ratio of the hydraulic radius of pipe running full of water to the hydraulic radius of a square section of a channel whose side is equal to the diameter of the pipe, is

(A) 1

(B) 0.5

(C) 0.33

(D) 0.75

7. In the most economical rectangular section of a channel, the depth is equal to

(A) 1/4th of the width

(B) 3 times of the hydraulic radius

(C) 1/2 of the width

(D) Hydraulic mean depth

8. The cross section of most efficient channel section is

(A) Semi circular

(B) Rectangular

(C) Triangular

(D) Trapezoidal

9. Which of the following soild waste disposal method is more environment friendly ?

(A) Saniatry landfill

(B) Incineration

(C) Composting

(D) Pyrolysis

19.01.2017

10. Match list I with list II and select correct answer using the codes given below the lists.

List I (Air pollutants)	List II (Harmful effects on)
a. SPM	1. Blood haemoglobin
b. NO.	2. Vegetation
c. CO	3. Respiratory system
d. SO_2	4. Building materials

Codes	a	b	c	d
A	3	4	2	1
B	4	3	2	1
C	3	4	1	2
D	4	3	1	2

11. In context with water polluted with sewage, what does BOD signify ?

(A) Biological Oxygen Demand

(B) Biology Of Degradation

(C) Bacteriological Oxygen Demand

(D) Biochemical Oxygen Demand

12. Iron may be present in significant quantities in

(A) Septic tank effluent

(B) Irrigation return water

(C) Rain water

(D) Fresh water from Deep Tubewell

13. Major air pollutant from thermal power station are

(A) Fly ash and ozone

(B) Fly ash and PAN

(C) Fly ash and SO_2

(D) Fly ash, H_2S and hydrogen fluoride

14. The most commonly used disinfectant of water is

(A) Chlorine Dioxide

(B) Chlorine

(C) Ozone

(D) UV ray

15. Irrigation canals are generally aligned along

(A) ridge line

(B) contour line

(C) valley line

(D) straight line

16. Silicosis is caused by

(A) Textile industries

(B) Sugar industries

(C) Storage battery industries

(D) Stone crushers

17. The useful moisture of a soil is equal to the

(A) field capacity

(B) saturation capacity

(C) moisture content at permanent wilting point

(D) difference between the field capacity and permanent wilting point within the root zone of the plants.

18. The top soil of a water logged field becomes more alkaline and its P_H value also becomes higher. The soil becomes practically infertile if its P_H value is

(A) 8

(B) 10

(C) 11

(D) 9

19. The most suitable location of canal head works, is

(A) Boulder stage of the river

(B) Delta stage of the river

(C) Rocky stage of the river

(D) Trough stage of the river

20. When a canal is carried below a natural drainage such that its FSL does not touch the underside of the supporting structure, the structure so provided is a

(A) Syphon

(B) Aqueduct

(C) Super passage

(D) Syphon aqueduct

21. A land is said to be water logged if the soil pores within

(A) a depth of 40 cm are saturated

(B) a depth of 50 cm are saturated

(C) the root zones of the crops are saturated

(D) None of these

22. The minimum value of camber provided for thin bituminous surface hill roads, is

(A) 2.2%

(B) 2.5%

(C) 3.0%

(D) 3.5%

23. The chart used for recording the condition of track is known as :

(A) Rolling chart

(B) Track chart

(C) Hallade chart

(D) Vibro chart

24. Points and crossings are provided for change of ..... on permanent ways.

(A) gauge

(B) direction and gradient

(C) direction

(D) gradient

25. In broad gauge, the clear horizontal distance between the inner faces of two parallel rails forming the track is :

(A) 1m

(B) 1.676m

(C) 0.6096m

(D) 1.50m

26. The force which resists the forward movement and speed of train is called :

(A) Track modulus

(B) Hauling resistance

(C) Friction

(D) Tractive resistance

27. If Δ is the depth of water in metres, B is the number of days in Base period and D is the duty in ha./cumec, then

(A) $\Delta = 8.64\ D/B$

(B) $B = 8.64\ \Delta/D$

(C) $D = 8.64\ \Delta/B$

(D) $\Delta = 8.64\ B/D$

28. In a diamond crossing the number of noses are

(A) 2

(B) 3

(C) 4

(D) 6

29. Packing of ballast is done

(A) near the ends of sleepers

(B) on the shoulder of the permanent way

(C) under the sleepers throughly compacted

(D) Between the two rails

30. The minimum length of a passenger platform for broad gauge railway should not be less than

(A) 305 m

(B) 183 m

(C) 495m

(D) 250m

31. In railways, super elevation is provided to

(A) facilitate drainage

(B) counteract the centrifugal push

(C) counteract the centripetal pull

(D) none of the above

32. In the hill roads, side drains are provided

(A) only on the hill side of the road

(B) only on the opposite side of the hill

(C) on both sides of the road

(D) none of the above

33. If the staff is not held vertical at a leveling station, the R.L. calculated from the observation would be

(A) True R.L.

(B) Less than true R.L.

(C) More than true R.L.

(D) None of the above

34. The imaginary line passing through the intersection of cross hairs and the optical centre of the objective is known as

(A) The line of sight

(B) The line of collimation

(C) The axis of telescope

(D) None of the above

35. The back sight of a staff held on B. M. point A having R.L. 300.00 m is 2.685m and the fore sight on staff held at B is 1.345m. The R.L of point B is

(A) 302.685 m

(B) 301.345 m

(C) 302.585 m

(D) 301.340 m

36. A series of close contours of values decreasing toward the centre of the series represents

(A) a hill

(B) a depression without an outlet

(C) a pass

(D) a river bed

37. In chain surveying a tie line is primarily provided

(A) to check the accuracy of the survey

(B) to take offsets for detailed survey

(C) to avoid long offsets from other chain lines

(D) to increase the number of chain lines

38. In setting up a plane table at any station

(A) the levelling is done first

(B) the centering is done first

(C) the levelling and centering are done simultaneously

(D) the orientation is done first

39. The area of any irregular figure can be calculated accurately with the help of :

(A) Pentagraph

(B) Sexant

(C) Clinometer

(D) Planimeter

40. The theodolite employed for tacheometry by stadia system differs from an ordinary transit only in having the diaphgram fitted with :

(A) two additional horizontal hairs

(B) two additional vertical hairs

(C) two additional horizontal and two additional vertical hairs

(D) None of the above

SECTION – B

6×15 = 90

Answer *all* questions restricting each answer within 40 words.

1. What is ideal fluid and its characteristics ?

2. If a fluid flows through a pipe, what are the various energy losses in pipes ?

3. Write a short note on the number of methods employed to ascertain the average velocity of flow in open channel.

4. What is Evapotranspiration and effective rainfall ?

5. Define Unit Hydrograph.

6. What is the yield of a well ? What tests are performed to find the yield ? Explain any one test.

7. How a flood control reservoir manages the flood ?

8. Name some important primary air pollutants and secondary air pollutants.

9. Describe the preventive measures that can be adopted to tackle water pollution.

10. Write a short note on sanitary land fill.

11. Write important reasons for providing road drainage.

12. What are the prime causes of failures in sub-grade and sub-base of flexible pavement ?

13. What is the Uni-gauge policy of Indian Railways ?

14. Write a list of instruments and materials used in plane table surveying.

15. What are the methods for finding the reduced level of a point ? Write in details about any one method.

SECTION- C

Answer all the numerical questions. 6×5=30

1. The difference of head observed between two ends of a 500m long pipe with 200m diameter is, 2.0 metre. Neglecting minor losses, calculate the discharge flowing through the pipe, considering Darcy's co-efficient of friction as 0.01.

2. The culturable command area of a water course is 1500 ha. Intensities of irrigation for sugarcane and wheat crops are 30% and 40% respectively. The duties of the crop at the head of the water course are 700 ha/cumec and 1600 ha/cumec respectively. Calculate the discharge required at the head of water course.

3. The following offsets were taken from a chain line to an irregular boundary line at an interval of 10m.

   0, 2.50, 3.50, 5.00, 4.60, 3.20, 0 m.

   Compute the area between the chain line, the irregular boundary line and the end of offsets by Simpson's rule.

4. Estimate the theoretical maximum capacity of a traffic lane with one way traffic lane with one way traffic flow at a stream speed of 50 kmph. Assume the average space gap between vehicles to follow the relation Sg = 0.278 Vt. V is the stream speed in Kmph, t is the average reaction time = 0.8 sec, assume average length of vehicles = 4.0m.

5. Determine the Plume height (Δ h) of a stack with following data using Holland's equation :

   (i) Physical stack is 200 m tall with 1.0m inside diameter.

   (ii) Air temperature is 30°C

   (iii) Velocity of wind is 3m/sec

   (iv) Barometric pressure is 1000 millibars

   (v) Stack gas velocity is 12m /sec

   (vi) Stack gas temperature is 150°C.

(Space for rough work)